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the preferred embodiment, the chip carrier and the board are both made of the above noted glass filled epoxy FR-4 material which has [, having] a thermal coefficient of expansion of [at least about 15×10^{-6} ppm/°C, preferably at least about 16×10^{-6} ppm/°C, and even more preferably] about $17-20 \times 10^{-6}$ ppm/°C.

In the Claims

Please cancel claims ~~13-20~~ and ~~26-33~~.

Remarks

The comments and recommendations in paragraphs 1-4 of the Office Action concerning applicant's reissue oath/declaration, drawings, surrender of the original letters patent and the preliminary amendment of January 8, 1998 have been noted. Deferral of drawing corrections and delivery of the original letters patent pending notification of allowable subject matter is respectfully requested.

The foregoing amendment to the specification cancels the amendments requested in the Preliminary Amendment of January 8, 1998. Claims 13-20 and 26-33 have also been canceled. We submit that these amendments remove all of the material that was rejected as constituting new matter, and that the rejections of the canceled claims should be withdrawn. Cancellation of claim 16-20 also renders moot the rejections of these claims under 35 U.S.C. 112 as indefinite.

Reconsideration of the rejections of claims 1-12, 21-25 and 34 is respectfully requested.

Claims 1-12, which were retained from original patent 5,483,421, were rejected under 35 U.S.C. 112., first paragraph, because the original specification, at page 7, lines 15-18 of state that "in the preferred embodiment the chip carrier and the board are both made of glass filled epoxy FR-4 material which has a thermal coefficient of expansion of about $17-20 \times 10^{-6}$ ppm/°C." (Emphasis added.) There is nothing to suggest that there is any specific upper limit to coefficients of thermal expansion for organic dielectric materials that can be used in these structures.

It is worth noting that claims 1-12, as presented herein, were not rejected by either the Examiner or the Board of Appeals in application 07/848,467, which produced the '421 patent, on the grounds that the absences of a upper limit for the coefficient of thermal expansion rendered the

claims indefinite. We submit that the treatment of these claims in the '467 application was correct. Claims 1-12 have no upper limit, but this does not render the claims indefinite.

In *re Kirsch, Barnby, and Potts*, 182 USPQ 286 (C.C.P.A. 1974), the court stated that:

“The imposition of a maximum limit on a quantity of one of the reactants without specifying a minimum does not warrant distorting the overall meaning of the claim, to preclude performing the claimed process. The rejection of claim 86 will not be sustained.” 182 USPQ at 290

Similar guidelines for claim construction were provided by the Court of Customs and Patent Appeals in *In re Johnson and Farnham*, 558 F.2d 1008, 194 USPQ 187 (1977), in which the court stated:

“First, we note that it is the function of the specification, not the claims, to set forth the “practical limits of operation” of an invention. In *re Rainer*, 49 CCPA 1243, 1248, 305 F.2d 505, 509, 134 USPQ 343, 346 (1962). One does not look to claims to find out how to practice the invention they define but to the specification. In *re Roberts*, 470 F.2d 1399, 1403, 176 USPQ 313, 315 (CCPA 1973); In *re Fuetterer*, 50 CCPA 1453, 319 F.2d 259, 138 USPQ 217 (1963).” In *re Johnson et al.*, 194 USPQ at 195.

“The PTO would limit appellants to claims reciting a sigma* value of at least 0.7. This view is improper because it requires the claims to set forth the practical limits of operation for the invention and it effectively ignores the scope of enablement provided by the specification as a whole. As we said in *In re Goffe*, 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976):

“ “[T]o provide effective incentives, claims must adequately protect inventors. To demand that the first to disclose shall limit his claims to what he has found will work or to materials which meet the guidelines specified for “preferred” materials in a process such as the one herein involved would not serve the constitutional purpose of promoting progress in the useful arts. See *In re Fuetterer*, 50 CCPA

1453, 1462, 319 F.2d 259, 265, 138 USPQ 217, 223 (1963),” *In re Johnson et al.*, 194 USPQ at 195.

The specification of this application provides ample guidelines for the practice of the invention defined by claims 1-12. There is no showing that there is any upper limit to the acceptable upper limits for organic dielectric materials that may be employed in these structures and processes. Under the teachings of cases such as *Kirsh* and *Johnson*, we submit that claims 1-12 are definite and should be allowed. Such action is respectfully requested.

Reconsideration of the rejection of claims 21-25 and 34 under 35 U.S.C. 251 as being an improper recapture of claimed subject matter deliberately canceled in the application for the patent upon which the present reissue application is based is also respectfully requested. As noted at page 7 of the Office Action, these claims do not require that the organic dielectric material for the chip carrier be a glass-filled epoxy, or have any specific coefficient of thermal expansion. However, the claims do require encapsulation of soldered connections between pads on the circuit chip pads on an organic dielectric chip carrier. This limitation makes claims 21-25 and 34 substantially narrower than the broad claims of the ‘467 application. These limitations also capture the essence of this invention. As stated in the second paragraph of the first page of the Invention Disclosure attached to the Declaration by Ronald Gedney submitted with this application, and in paragraph 7 of that Declaration, Mr. Gedney and his co-inventor Tamara Powers (nee Sholtes) realized that recent developments in encapsulation technology made it possible to mount integrated circuit chips on chip carriers with higher coefficients of thermal expansion than previously thought possible.

As noted on page 8 of the Office Action, several prior art references disclose encapsulation. However, none of the references cited in the ‘467 application or this application disclose or suggest that integrated circuit chips can be successfully mounted via solder connections to organic dielectric chip carriers, which has substantially higher coefficients of thermal expansion, if the solder connection is encapsulated. Thus, the encapsulation limitation is material and significant. As noted on page 9, paragraph 15.C of the Declaration by William N. Hogg submitted with this application, we believe that applicants were and are entitled to claim packages and methods for mounting integrated circuit chips on a circuit board wherein the chip is bonded by solder connections to an organic chip carrier, with an encapsulation material encapsulating the solder connections between the chip and the carrier.

Statements by the United States Court of Appeals for the Federal Circuit in *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ 2d 1641 (Fed. Cir. 1998), a recent action for infringement of reissued patents, are relevant to issues in this application:

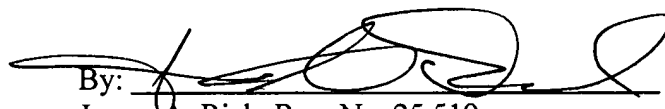
Finally, because the recapture rule may be avoided in some circumstances, we consider whether the reissue claims were materially narrowed in other respects. *See, e.g. Mentor*, 998 F.2d at 996, 27 USPQ2d at 1525 (“Reissue claims that are broader in certain respects and narrower in others may avoid the effect of the recapture rule.”) *Clement*, 131 F.3d at 1470, 45 USPQ2d at 1165. For example in [*Ball Corporation v. United States*, 729 F.2d 1429, 221 USPQ 289 (Fed.Cir. 1984)] the recapture rule was avoided because the reissue claims were sufficiently narrowed (described by the court as “fundamental narrowness”) despite the broadened aspects of the claims. 729 F.2d at 1438, 221 USPQ at 296. In the context of a surrender by way of argument, this principle, in appropriate cases, may operate to overcome the recapture rule when the reissue claims are materially narrower in other overlooked aspects of the invention. The purpose of this exception to the recapture rule is to allow the patentee to obtain through reissue a scope of protection to which he is rightfully entitled for such overlooked aspects.” 46 USPQ 2d at 1649-1650.”

We submit that, as in *Ball*, claims 21-25 and 34 of this application are sufficiently narrowed with respect to a fundamental aspect of the invention, to avoid the recapture rule, despite the broaden aspect of the claims. Such action is respectfully requested.

Conclusion

For the reasons set forth above, we submit that claims 1-12, 21-25 and 34 are in condition for allowance. Such action is respectfully requested.

Respectfully submitted,

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